

# Exploring different dynamics in emerging versus developed countries for wireless broadband access and mobility

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# Senza Fili Consulting

## experience in wireless data



### Technology focus

- Wireless data technologies and services, including Wi-Fi, WiMAX, proprietary BWA, GSM, WCDMA, EV-DO, HSPA

### Approach

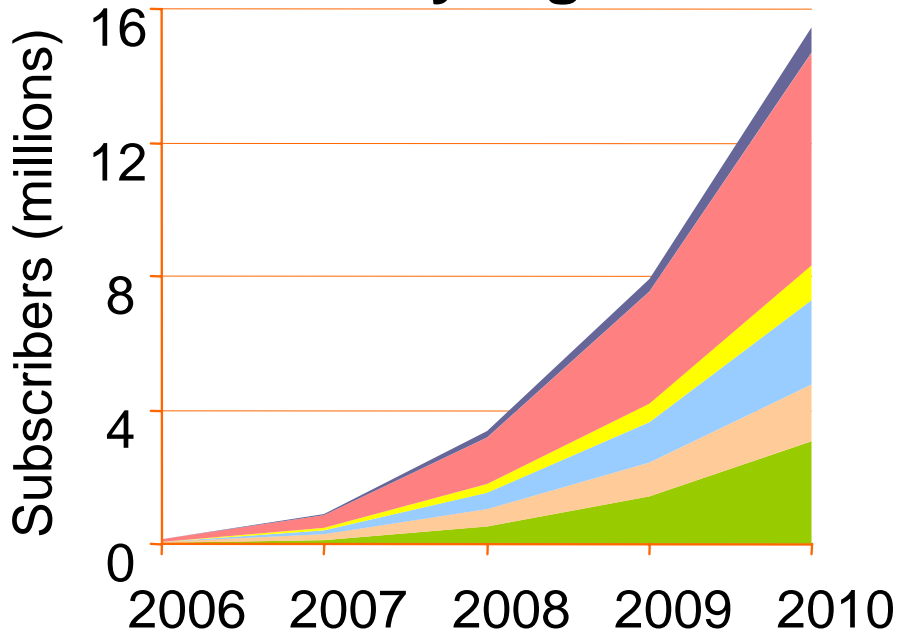
- Bridge between technologies and services
- Quantitative analysis
- International perspective

### Services

- Business plans and financial modeling
- Business development and strategy
- Market research and forecast

# WiMAX subscribers worldwide will reach 15.4 million by 2010

## Number of broadband subscribers by region in 2010



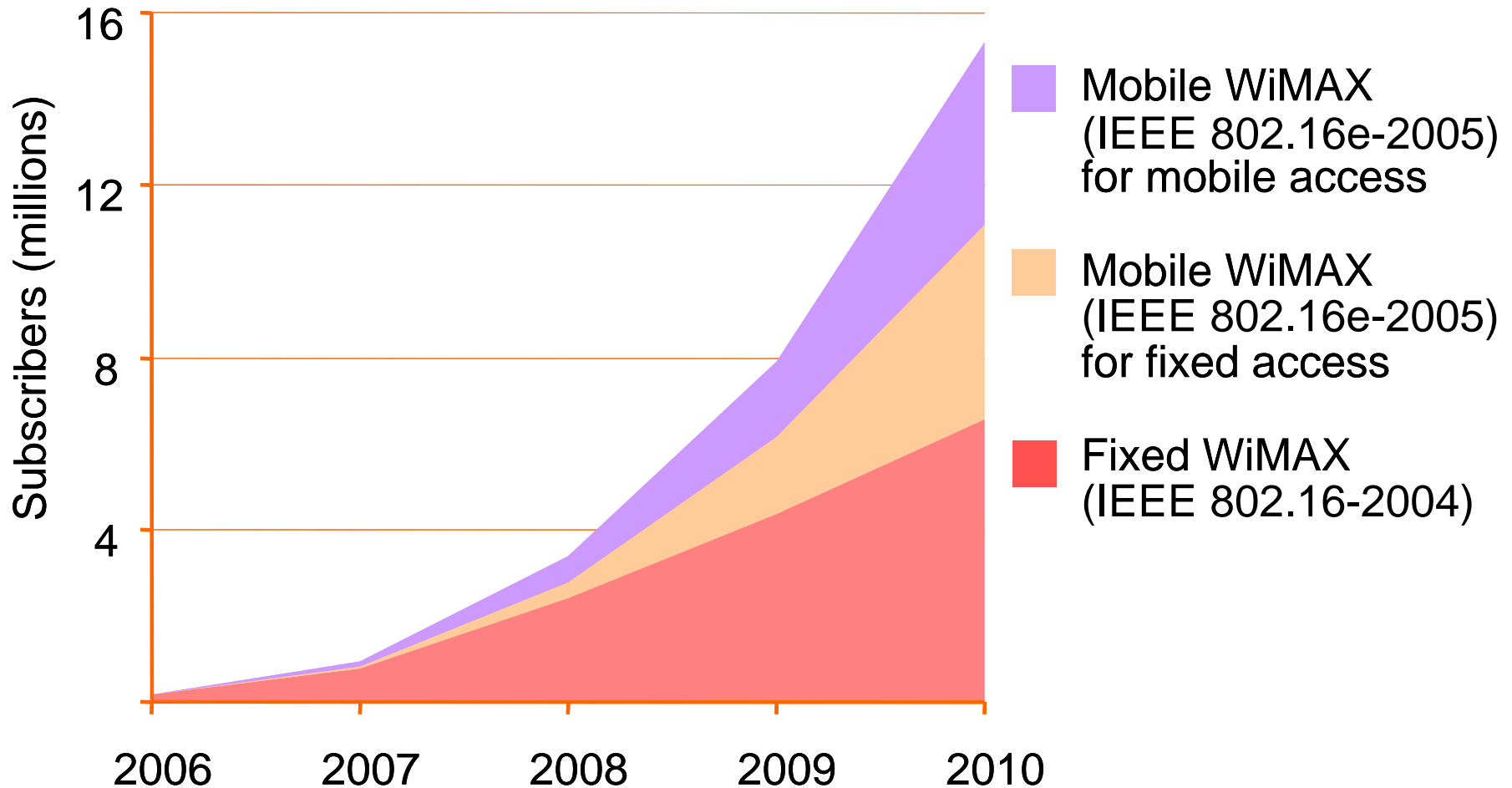
- North America
- Latin America
- Western Europe
- Eastern Europe
- Asia Pacific
- Rest of the world

- 57% of WiMAX subscribers will be using 802.16e by 2010
- US\$16.5 billion in service revenues
- Drivers to adoption are different in each market
- Asia-Pacific countries will be WiMAX largest market with 41% of subscribers

Source: Senza Fili Consulting, "Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX"

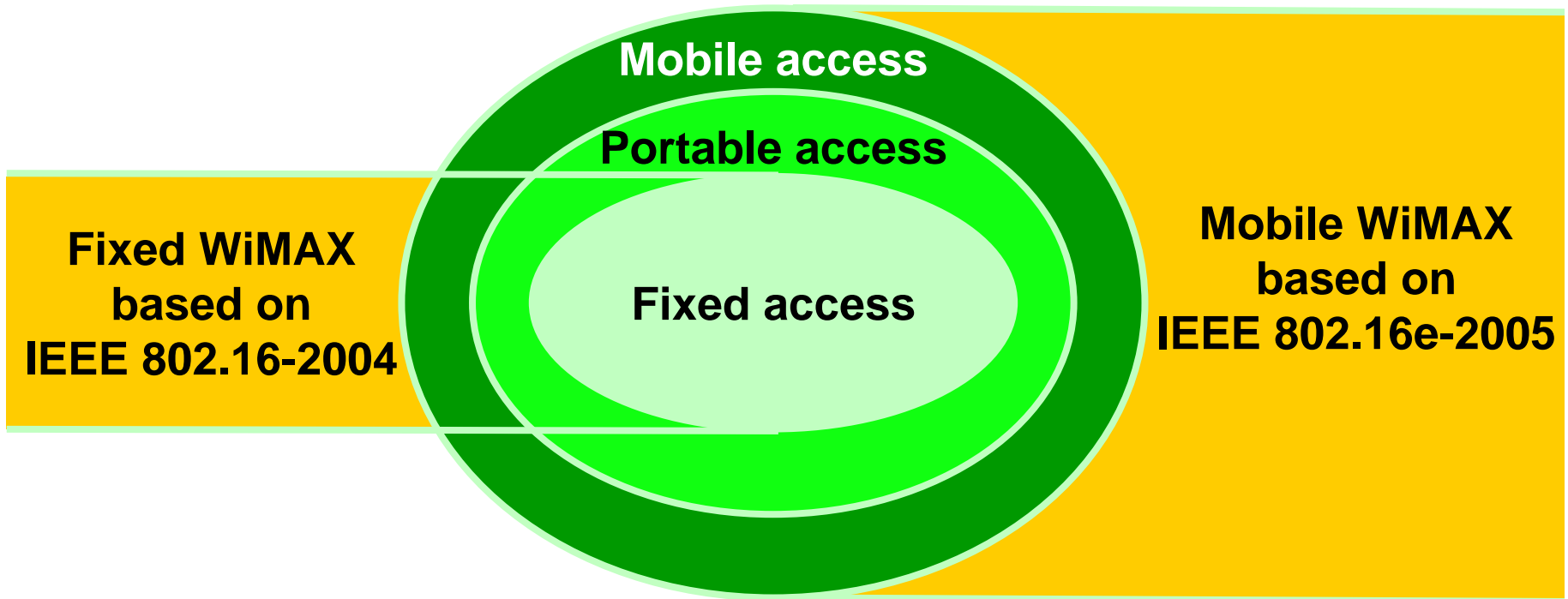
# Mobile WiMAX will quickly become dominant

## WiMAX subscribers



Source: Senza Fili Consulting, "Fixed or mobile WiMAX? Forecasts and assessment for the transition from 802.16-2004 to 802.16e WiMAX"

# Mobile WiMAX also supports fixed access



**Fixed WiMAX  
based on  
IEEE 802.16-2004**

**Mobile WiMAX  
based on  
IEEE 802.16e-2005**

**Mobile access**

**Portable access**

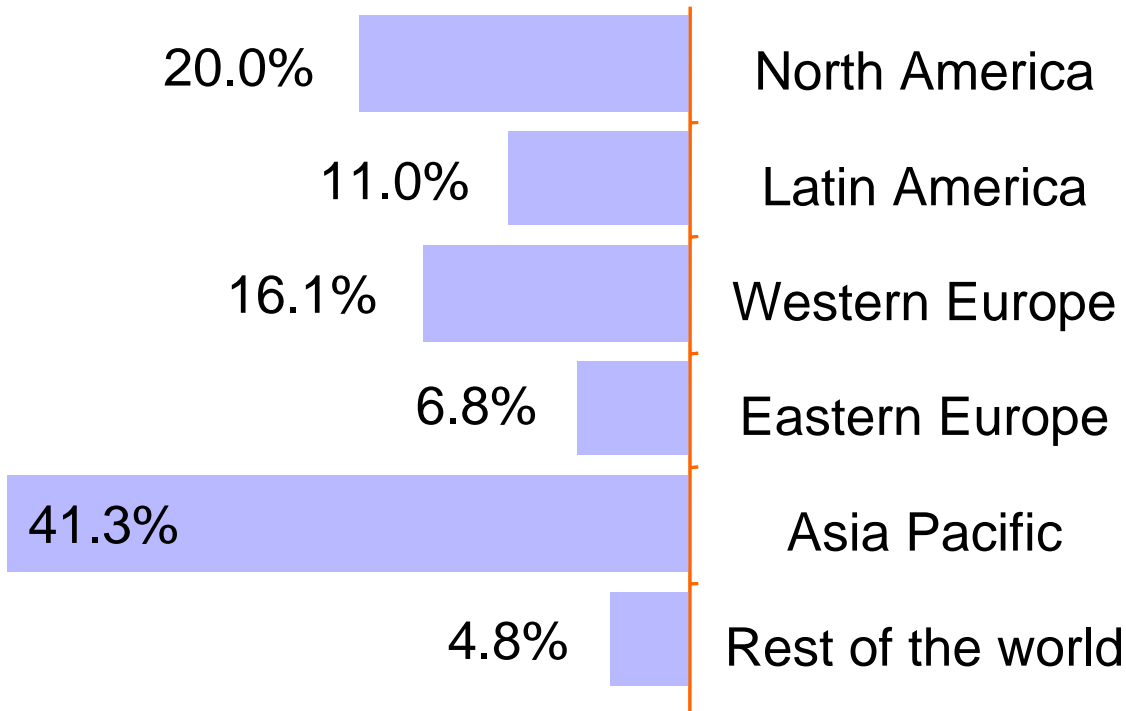
**Fixed access**

# What are the differences between Fixed and Mobile WiMAX?

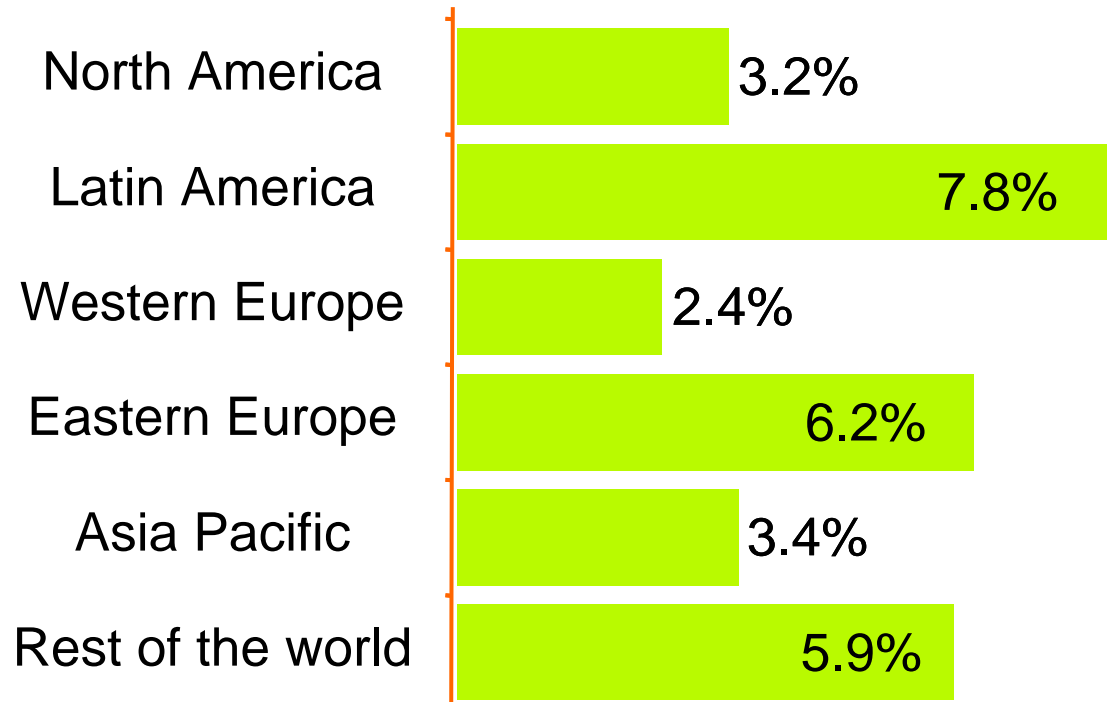
	<b>Fixed WiMAX</b>	<b>Mobile WiMAX</b>
<b>Standard</b>	802.16-2004	802.16e-2005
<b>Access</b>	Fixed	Fixed, portable, mobile
<b>Modulation</b>	OFDM	OFDMA
<b>Subscriber unit</b>	Outdoor or indoor CPE, PCMCIA card	Indoor CPE, PCMCIA card, mini-card built in laptops, mobile devices
<b>Certification starts</b>	July 2005	1Q2007 (Expected)
<b>Certified products</b>	January 2006	1H2007 (Expected)

# WiMAX will have a stronger role in emerging markets

## Percentage of WiMAX global subscribers



## Percentage of WiMAX among broadband subscribers in the market



# Adoption dynamics vary greatly across markets

## Emerging markets

Fixed access (initially)

Low broadband penetration

Early phases of strong growth

Limited broadband availability

New entrants can get a large market share

Lower competition

## Developed markets

Mobile and portable access

High broadband penetration

Broadband market approaching saturation

80-95% broadband coverage

Dominant players control the market

Strong competition from 3G, DSL and cable

# WiMAX can bring broadband to the mass market in emerging markets

- Wired infrastructure is insufficient to meet demand
- Demand is concentrated in metropolitan areas
  - Subsidies may needed in rural areas
- Business market is low hanging fruit
  - The residential market is a great, mostly untapped opportunity for the longer term
- VoIP is often a key to attract customers
- Licensed spectrum is preferred and often required
- Initial demand is mostly for fixed services
  - Portability and mobility will become important later

# ..but some challenges have to be addressed

- Suitable spectrum is needed
  - Regulators are becoming more receptive
- Cost for equipment has to come down
- Vendors need to tailor their products to emerging markets
  - Battery operated devices
  - Cheap CPEs with support for VoIP
- Low ARPUs should be expected as the market grows

# In developed markets, WiMAX can make personal broadband affordable

- Mobile broadband access is still very limited
  - Expensive service plans
  - Traffic limitation
  - Very few data-only subscribers
- Lower cost-per-bit makes WiMAX best technology for mobile broadband
- WiMAX enables personal broadband services
  - Combine advantages of fixed and mobile broadband access

# ...but competition from existing and emerging technologies is strong

- Competition from existing and emerging technologies is strong
  - 3G performance is improving
  - LTE will offer comparable performance (but not yet)
- Demand is still unproven
  - Which applications?
  - Which devices?
- Business case for a stand-alone mobile data network is a difficult one
  - Personal broadband a winning strategy
  - Multiple air interfaces complement each other

# Concluding remarks

- WiMAX deployments will vary greatly in different markets
  - Mobile and personal broadband services to dominate in developed markets
  - Fixed access to be offered in emerging countries
- WiMAX is ideally suited to meet market demand in developing countries
  - WiMAX facilitates the transition to mobile broadband
- Developed markets are more challenging for WiMAX
  - Affordable personal broadband is key to adoption

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